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TSAO

Pattern Projection Techniques for Volumetric 3D Displays and 2D Displays

Inventor: Che-Chih Tsao

16 Walnut St., #43

Arlington MA 02476-6154

ABSTRACT

This invention relates generally to image projection methods and apparatus for creating color or gray scale images using spatial light modulators (SLMs) without color or gray capability. The basic concept is to divide the pixels on a single SLM into multiple groups and then illuminate each group with a different primary color. The content of the single SLM panel can then be programmed as if there are multiple sub-panels illuminated with different primary colors. The combined image on the single panel therefore displays images of many colors. Illumination can be achieved by projection of a pattern of color or gray scale distribution to the surface of the SLM panel and registering the pattern to corresponding pixel groups; or can be implemented by applying a proximity pattern close to the SLM surface. This technique can be applied to volumetric 3D displays, 2D displays, and optical correlators.

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